FRSL Working Group Overview

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At

#1 FRSL Working Group Meeting

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Flywheel Rotor Safety & Longevity (FRSL)

- **Safety concerns should always have the highest priority**
  - Mandatory for manned space systems
  - Mandatory for unmanned space systems when workers are around
- **Longevity concerns are related to mission success**
  - A reliability issue that is applicable to manned and unmanned systems
  - Emphasize on economic life (durability)
- **Different requirements should be implemented for different applications to achieve safety and longevity in cost-effective way**
  - Flywheels used in manned space systems should meet safety requirements such as NASA STD-5003, Shuttle Payload Fracture Control Requirements
  - Flywheels used in unmanned space systems need to comply with requirements to be developed

Working Group (WG) Objectives

- **To develop industry-wide certification standards for rotors of flywheels used in space systems to achieve safety & longevity**
  - Military satellites
  - NASA space systems
  - Commercial satellites
- **Areas covered in the standards should be multi-discipline oriented**
  - Design criteria & analysis techniques
  - Material allowable test methods
  - Fabrication process control requirements
  - Qualification test requirements & approaches
  - Flight rotors acceptance requirements
  - Health monitoring technologies

WG Organization

- **Sponsored by NASA/GRC and AF/RL**
- **Membership open to government/university/industry**
  - On voluntary basis
  - No government funding provided
  - Meet twice a year for general membership
  - Non-disclosure agreement will be signed on case-by-case basis
- **WG members can select suitable writing panels**
  - Flywheel Rotor Safe-Life Certification Standard (NASA or AIAA)
  - Material Strength Test Standards (NASA or ASTM)
  - Implementation Guidelines, Material Database, etc. (NASA)

Current Status

- **Many organizations have signed up to participate in WG**
  - ETC High Performance Composites, Beacon Power, AFS Trinity Power, Barbour Stockwell, Toray Composites (America), Flywheel Energy Systems, Optimal Energy Systems, Honeywell, TRW, Lockheed Martin, Auburn University, Penn State University, UT/CEM, Oak Ridge National Lab., National Research Council- Canada
- **In First WG Meeting, members will discuss open issues**
  - End products
  - Proprietary data
  - ITAR concerns
- **Members will be invited to sign up various writing panels and to elect panel leaders**